

Amendments to the Drawings

The attached two sheets of drawings include changes to FIG. 2 and FIG. 6. The first sheet, which includes FIG. 1-2, replaces the original sheet including FIG. 1-2. In FIG. 2, the legend "Conventional Art" has been added. The second sheet, which includes FIG. 5-6, replaces the original sheet including FIG. 5-6. In FIG. 6, the legend "Conventional Art" has been added.

Attachment: Replacement Sheets
 Annotated Sheets Showing Changes

Remarks

Claims 1-22 and 24-29 are pending in the application. Claims 1-12 and 26-29 have been withdrawn and claims 23-25 have been canceled.

Drawings

In response to the objection to Figure 6, Applicants have amended Figure 6 to include the legend "Conventional Art". Applicants have also amended Figure 2 to include the legend "Conventional Art".

Abstract

In response to the Examiner's objection to the Abstract, Applicants have amended the abstract to delete the reference to "the present invention."

Rejection of Claims 15 and 16 Under 35 U.S.C. §112

Claims 15 and 16 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Claim 15 has been amended to clarify that the c-axis of both the first wurtzite crystalline layer and the second wurtzite crystalline layer is perpendicular to the surface of the substrate. Support for the amendment may be found in the specification at page 27, third paragraph to page 28, second paragraph.

Claim 16 has been amended to delete the terminology "and/or" in reference to the first and second wurtzite layers and recite the language "at least one of the first and second wurtzite layers". Applicants respectfully request withdrawal of the rejection of claims 15 and 16 under 35 U.S.C. §112.

Claim Rejections Under 35 U.S.C. §102(b)

Claims 13-21 have been rejected under 35 U.S.C. §102(b) as being anticipated by Masuo et al. (JP 57-48820). Claim 13 has been amended to recite that the first wurtzite layer has a thickness of 50 nm to 200 nm and that the functional layer is made of molybdenum or tungsten or a compound containing at least one of molybdenum or

tungsten, the functional layer having a thickness of 100 nm to 300 nm. Support for the amendment can be found in original claims 23 and 25 and in the specification at paragraphs [0002], [0003], [0018] and [0122] of the published application US 2007/0057285. Masuo et al. fails to disclose the claimed laminate structure. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 13-21 under 35 U.S.C. §102(b) as being anticipated by Masuo et al.

Claims 13-25 have been rejected under 35 U.S.C. §102(b) as being anticipated by Yamada et al. (US 2002/0190814). As discussed above, claim 13 has been amended to recite that the first wurtzite layer has a thickness of 50 nm to 200 nm and that the functional layer is made of molybdenum or tungsten or a compound containing at least one of molybdenum or tungsten, the functional layer having a thickness of 100 nm to 300 nm. Yamada et al. fails to disclose the claimed laminate structure.

The Examiner relies on Fig. 14 of Yamada et al. to support the rejection. The stacked thin film bulk acoustic wave resonator (SBAR) of Fig. 14 is obtained by merely overlapping two basic structures of the thin film bulk acoustic wave resonator (FBAR) of Fig. 1. The FBAR of Fig. 1 has the structure of a piezoelectric material layer 22 provided between two electrodes 21 and 23. Yamada et al. discloses a stack of three layers wherein the first and third layers are metal and the middle layer is made from piezoelectric material. Thus the layer sequence of Yamada et al. is exactly the opposite to the layer sequence of the claimed laminate.

The purpose of the structure of Fig. 14 of Yamada et al. is not to improve the crystallinity and crystal orientation of the second wurtzite crystalline layer formed on the functional material layer. Rather the function of the laminate of Yamada et al. is to induce acoustic waves inside the piezoelectric layer (22, 41, 42). The problem to be solved by the laminate of the present invention is, in the case of forming the layer made of wurtzite crystalline structure compound on the functional material layer that is a ground, to control the crystallinity and crystalline orientation of the wurtzite crystalline structure compound.

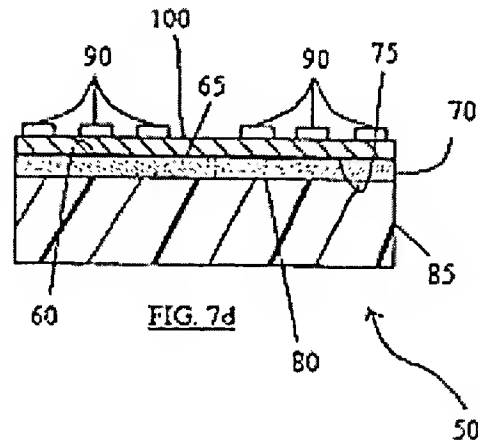
In the laminate of claim 13, the thickness of the first wurtzite crystalline layer is defined as 50 nm to 200 nm, and the thickness of the functional material layer is defined as 100

to 300 nm. Thus the first wurtzite crystalline layer is substantially as thick as or slightly thinner than the functional material layer. In Yamada et al., on the other hand, the piezoelectric material layer 42 is much thicker than the electrode layer 44, as is apparent from Figs. 2 and 14 and paragraphs [0089] and [0124]. The relationship between the thickness of the first wurtzite crystalline layer and the thickness of the functional material in the claimed laminate is different from the relationship of the thickness of the piezoelectric layer 42 and the thickness of the electrode layer 44 of Yamada et al. Because Yamada et al. fails to disclose or suggest the claimed laminate, Applicants respectfully request withdrawal of the rejection of Claims 13- under 35 U.S.C. §102(b) as being anticipated by Yamada et al.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 22 and 23 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Masuo et al. (JP 57-48820) in view of Sung (US 2005/0122189). With regard to claim 22, the Examiner contends that although Masuo et al. fails to expressly disclose that the functional material layer contains a metal having a body-centered cubic structure or a hexagonal close-packed lattice structure, Sung teaches a surface acoustic wave device in which the electrodes or functional material layers are made of tungsten or molybdenum and therefore it would have been obvious to combine the W or Mo electrodes of Sung with the device of Masuo et al. as both of these materials are well-known for their suitability for use as electrode materials in surface acoustic wave devices.

Applicants respectfully disagree with the Examiner's contention. Sung discloses a SAW filter (see Fig. 7d below) that includes a ceramic mold 55 upon which a thin nucleation enhancer layer 65 is formed. For SAW filters, the ceramic mold 55 is made of a piezoelectric material. Diamond layer 70 is grown on the thin nucleation enhancer layer 65. The growth side 80 of the diamond layer 70 is mounted on substrate 85. A plurality of interdigital transducers 90 (i.e. electrodes) are mounted on top of the piezoelectric material 55.



The Examiner has mistakenly relied on paragraph [0076] for the disclosure of a functional layer (electrode) made of tungsten or molybdenum. However, paragraph [0076] of Sung actually discloses the materials that may be used for the mold material. For SAW filters, the mold material is a piezoelectric material (see [0103] – [0105]).

As discussed above, Masuo et al. fails to disclose the laminate structure of claim 13. Even if Sung disclosed a body-centered cubic structure or a hexagonal close-packed lattice structure, the combination the Masuo et al and Sung by one skilled in the art would not result in the laminate of claim 22. Applicants respectfully request withdrawal of the rejection of claim 22 under 35 U.S.C. §103(a) based on Masuo et al. (JP 57-48820) in view of Sung. The rejection of claim 23 is moot in view of the cancelation of claim 23.

Claims 24 and 25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Masuo et al. (JP 57-48820) in view of Hachigo et al. (US 6984918). In view of the cancelation of claims 24 and 25, the rejection is moot.

Conclusion

Accordingly, all claims are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,

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